MEMORANDUM

TO: MEMBERS, ARIZONA STATE BOARD OF EDUCATION

FROM: ROBERT FRANCIOSI, ARIZONA DEPARTMENT OF EDUCATION

SUBJECT: PROPOSED CHANGES TO AZ LEARNS FORMULA

DATE: 8/23/2005

(REF #RE05012-E)

SUMMARY

The purpose of this memo is to provide you further information regarding changes to the AZ LEARNS school evaluation formula that ADE is proposing for this year. The purpose of the changes fall into three categories: changes to improve the formula as a measure of school performance, modifications due to the use of new tests, and changes to simplify the calculation.

The first section of this memo provides an outline of the components of an AZ LEARNS profile. The second section demonstrates the calculations in greater detail, and describes the proposed changes.

The AZ LEARNS formula is not technically complex. That is, it contains no high-octane, sophisticated statistical methods. Most of the operations involve addition, subtraction, multiplication, and division. An ambitious school principal could sit down with her students' scores, a pencil, and a calculator and determine her school's profile. However, the AZ LEARNS formula is complex in the sense that completing your income tax form is complex. There are numerous components, business rules, and special cases one must remember. It is the overall goal of these changes to reduce this form of complexity.

I. OUTLINE OF CURRENT AZ LEARNS FORMULA

The emphasis of the AZ LEARNS formula is on three measures of school performance:

1. The absolute level of student achievement at the school. This measure asks if the students in the school are achieving acceptable performance levels. This is known as the baseline measure. It looks at the percent of students in the school passing AIMS.

2. Growth in aggregate student achievement at the school. This measure asks if the school is making progress toward or beyond acceptable performance levels. This is known as the change or growth measure. It looks at the change over several years in the percent of students passing AIMS and the change in the percent of students in the lowest AIMS performance category.

3. Growth in individual student achievement at the school. This measure asks if the school is improving the academic performance of individual students from year to year. This is known as the Measure of Academic Progress (MAP) or added evidence measure. It is

measured using the state's norm-referenced test since in previous years, AIMS has not been given at every grade. It is only used for elementary schools.

Other measures of performance—the school's AYP status and, if it is a high school, its graduation and drop out rate—are required by federal and state law. The following table shows the specific components of the AZ LEARNS profile and how many points are possible to be awarded to schools for each.

Components of AZ LEARNS Profile (maximum points possible)

	Elementary School (2 grades)	Middle School (1 grade)	High School
AIMS points (baseline and aggregate growth)	36	18	18
MAP	15	8	0
Graduation/Dropout Rates	0	0	2
AYP	1	1	1
Total	52	27	21

AIMS POINTS

For each subject/grade combination a school offers, (e.g. 3rd grade math) it may earn up to 6 baseline points and 6 growth points. The baseline and growth points for each subject/grade are added giving 70 percent weight to the higher number and 30 percent weight to the lower number. For example, if for 3rd grade math a school earned 5 baseline points and 4 growth points it will earn (.7) X 5 +(.3) X 4 = 4.7 total points. If for 3rd grade math it earned 3 baseline points and 6 growth points it will earn (.3) X 3 + (.7) X 6 = 5.1 total points. Under the current formula, the points earned by a school for each subject/grade are then added up. Thus, the total number of points earned by a school depends upon the number of grades it offers. A school could earn up to 18 (= 3 subjects X 6 points) per grade. A typical elementary school serving grades K-6 could earn 36 points from AIMS, a middle school 18 points, and a high school 18 points.

MAP AKA ADDED EVIDENCE POINTS (ELEMENTARY SCHOOLS ONLY)

The Measure of Academic Progress (MAP) examines the performance of individual students across time. Because the AIMS has not been administered at every grade, MAP is measured using the state's norm-referenced test. Since the norm-referenced test has only been administered in grades 2-8, MAP has only been used to evaluate elementary schools.

AZ LEARNS awards points for MAP based on the percent of students in a school making one-year's growth. One year's growth for a student is defined as remaining roughly at the same percentile rank from year to year. For example, if a student scored in the 45th percentile rank as a fourth grader and scored at the 45th or above percentile rank as a fifth grader, that student is considered to have made one-year's growth. The table below shows the number of points AZ LEARNS awards to schools for the percentage of students making one-year's growth.

Distribution of Elementary Added Evidence Points by Subject/Grade Combination		
% Making One-Year's Growth	Number of subject/grade Combinations	
	3	6
90% +	8	15
80%-89%	6	11.25
70%-79%	4	7.5
60%-69%	2	3.75

AYP

A school is awarded 1 point if it has made AYP, 0 points if it has not.

GRADUATION/DROPOUT RATES

This memo will not discuss these points in detail since we are not proposing to change how they are calculated this year. In essence high schools are awarded points if either their graduation and dropout rates hit statewide goals or if these rates show improvement over previous years. Schools may earn a total of two points from this measure.

DETERMINATION OF SCHOOL PROFILE

AZ LEARNS determines a school profile by comparing the total number of points earned to the scales below.

Points need to earn the AZ LEARNS profiles			
	Elementary School	Middle School	High School
Underperforming	<24	<12	<9.6
Performing	24	12	9.6
Highly Performing	27.6	13.8	15
Excelling	32.4	16.2	16.2

To be a highly performing or excelling, a school must also meet a target for the percentage of students exceeding the standard on the AIMS test. The targets depend on the grades served by the school. The table below shows the targets used for the past two years. For example, to be excelling the typical elementary school (six subject/grade combinations serving grades 3 and 5) would have to have 38.8 percent of its students exceed the standard on the AIMS.

Excelling and Highly Performing Targets by Grades Offered			
Subject/Grade Combinations	Serving Grades	Highly Performing	Excelling
3	3 or 5	22.6%	28.7%
3	8	6.5%	10.7%

6	3 and 5	30.9%	38.8%
6	5 and 8	19.9%	31.7%
9	3, 5 and 8	19.3%	25.7%
3	High School	9.3%	12.7%

II. CALCULATION OF AN AZ LEARNS SCHOOL PROFILE

THE BASELINE/STATUS MEASURE

How it is done now.

For each subject/grade taking the AIMS test at a school, the school receives baseline points depending on the baseline group to which each subject/grade belongs. The baseline group for each subject/grade is determined by how many students passed AIMS in the baseline years. The table below shows the baseline years.

Baseline Years	
Year school opened	Baseline years
2000 or before	Average of 2000 and 2001
2001	Average of 2001 and 2002
2002	2002
2003	New school not evaluated
2004	New school not evaluated

Example. Gila Monster Elementary has been open since 2000. The second column of table 2 shows the average percentage of third grade students passing AIMS in Gila Monster Elementary in the baseline years of 2000 and 2001. These numbers are compared to the baseline groups shown in table 3. The number of baseline points earned by the school depends upon which group it is in. For example, 45 percent of the students passing math earns Gila Monster 3 baseline points.

Baseline Points for 3rd Grade at Gila Monster Elementary		
Subject	Average Percent Passing AIMS in 2000/2001	Baseline points
Math	45	3
Reading	75	4

Writing	60	2

Baseline/Status Points							
		Number of Points					
Grade	Subject	1	2	3	4	5	6
3	Math	0% - 26%	27% - 40%	41% - 56%	57% - 71%	72% - 82%	83% - 100%
3	Reading	0% - 46%	47% - 59%	60% - 73%	74% - 84%	85% - 91%	92% - 100%
3	Writing	0% - 54%	55% - 67%	68% - 79%	80% - 89%	90% - 94%	95% - 100%

How we propose to do it.

For each subject/grade taking the AIMS test at a school, the school receives status points depending on the percentage of students passing AIMS in that subject/grade in the current year.

Example. The second column of table 4 shows the average percentage of third grade students passing AIMS in Gila Monster Elementary in the current year. These numbers are compared to a table that converts percent passing to points earned. If this table looks like table 3, 45 percent of the students passing math earns Gila Monster 3 status points.

Status Points for 3rd Grade at Gila Monster Elementary		
Subject	Average Percent Passing AIMS in current year	Status points
Math	45	3
Reading	75	4
Writing	60	2

Why we are changing it.

Awarding points based on performance in baseline years results in schools being judged in part on a factor that they cannot control. Schools with high baselines can rest on their laurels, while schools with low baselines continue to carry the burden of past problems. In most other states, the current year is used in the accountability system. It is more logical, fair, and accurate to award points for AIMS based on the percentage of students passing AIMS in the current year.

Important Note: The groups shown in table 3 and for other subjects and grades were set based on performance of schools statewide in 2000 and 2001. For all grades and subjects, baseline group 1 represents the bottom 10 percent of schools in those years; baseline group 2 represents the schools

that fell between the 10th and 25th percentiles; baseline group 3 the 25th and 50th percentiles; baseline group 4 the 50th and 75th percentiles; baseline group 5 the 75th and 90th percentiles; and baseline group 6 the top 10 percent of schools. Going back to table 3 we see that in 2000 and 2001, more than 82 percent of students passed third grade math in the top 10 percent of schools. In the average school approximately 56 to 57 percent of students passed.

The ADE is proposing new status groups to reflect the new standards for the AIMS. The method used for setting the new cut points is the same as before: the cut points represent the 10th, 25th, 50th, 75th, and 90th percentiles of schools statewide for the relevant subject and grade levels. The proposed new status groups are given in the table below. The old baseline groups are shown below that.

Proposed Status Groups

Grade	Subject	Status Group 1	Status Group 2	Status Group 3	Status Group 4	Status Group 5	Status Group 6
3	Math	<51%	51-64%	65-78%	79-88%	89-94%	>=95%
3	Read	<46	46-59	60-73	74-84	85-92	>=93
3	Writ	<56	56-67	68-78	79-87	88-93	>=94
4	Math	<46	46-60	61-75	76-86	87-93	>=94
4	Read	<40	40-53	54-69	70-81	82-90	>=91
4	Writ	<42	42-53	54-65	66-77	78-85	>=86
5	Math	<42	42-56	57-72	73-85	86-92	>=93
5	Read	<42	42-56	57-73	73-84	85-92	>=93
5	Writ	<47	47-57	58-69	70-80	81-87	>=88
6	Math	<34	34-49	50-66	67-81	82-90	>=91
6	Read	<38	38-52	53-69	70-82	83-91	>=92
6	Writ	<49	49-60	61-73	74-83	84-90	>=91
7	Math	<35	35-49	50-66	67-81	82-90	>=91
7	Read	<41	41-54	55-69	70-82	83-90	>=91
7	Writ	<64	64-73	74-82	83-89	90-94	>=95
8	Math	<27	27-41	42-59	60-76	77-87	>=88
8	Read	<35	35-48	49-65	66-79	80-88	>=89
8	Writ	<58	58-70	71-82	83-90	91-95	>=96
HS	Math	<5	5-13	14-29	30-51	52-70	>=71
HS	Read	<16	16-28	29-46	47-65	66-79	>=80
HS	Writ	<18	18-30	31-48	49-67	68-80	>=81

Current Baseline Groupings

Grade	Subject	Baseline Group 1	Baseline Group 2	Baseline Group 3	Baseline Group 4	Baseline Group 5	Baseline Group 6
3	Math	<26%	27-40%	41-56%	57-71%	72-82%	>=83%
3	Reading	<46	47-59	60-73	74-84	85-91	>=92
3	Writing	<54	55-67	68-79	80-89	90-94	>=95
5	Math	<11	12-21	22-36	37-52	53-66	>=67
5	Reading	<31	32-44	45-60	61-75	76-85	>=86
5	Writing	<25	26-38	39-53	54-68	69-79	>=80
8	Math	<1	2-5	6-12	13-22	23-34	>=35
8	Reading	<25	26-37	38-51	52-66	67-77	>=78

8	Writing	<18	19-28	29-42	43-56	57-68	>=69
H.S.	Math	<3	4-8	9-19	20-33	34-47	>=48
H.S.	Reading	<28	29-42	43-58	59-73	74-83	>=84
H.S.	Writing	<16	17-25	26-39	40-53	54-66	>=67

THE CHANGE OR GROWTH MEASURE

How it is done now.

For each subject/grade taking the AIMS test at a school, the school receives growth points depending on the growth group to which each subject/grade belongs. The growth group for each subject/grade is determined by the change in the percentage of students passing AIMS and the change in the percentage of student scoring at the lowest performance level (falls far below or FFB) over the past three to five years.

Example. Gila Monster Elementary has been open since 200 Table 5 shows the average percentage of third grade students passing and scoring FFB in math in the baseline years of 2000 and 2001; and the average percentage the average percentage of third grade students passing and scoring FFB in the subsequent three years: 2002, 2003, and 2004. Determining how many points the school earns for this subject/grade is a four step process.

1. The difference between the percent of students passing between the growth and baseline years is determined: 50 – 45 = 5;

2. The difference between the percent of students FFB between the growth and baseline years is determined: 10– 15 = -5;

3. The difference between the numbers found in (1) and (2) is determined: 5 – (-5) = 10;

4. The total percentage change is compared to a table like table 6 to determine growth grouping. The number of points earned equals the growth grouping. Gila Monster Elementary's 10 points earns it 3 growth points.

Growth Points for 3rd Math Grade at Gila Monster Elementary

Years	Percent students passing	Percent students FFB
Growth (average of 2002, 2003, 2004)	50	10
Baseline (average of 2000 and 2001)	45	15
Change	5	-5
Difference	5 – (-5) = 10	

Growth Point Groupings							
Grade	Subject	Growth Point Grouping 1	Growth Point Grouping 2	Growth Point Grouping 3	Growth Point Grouping 4	Growth Point Grouping 5	Growth Point Grouping 6
3	Math	<-1.75%	-1.74% - 4.18%	4.19% - 112%	113% - 16.05%	16.06% - 21.98%	21.99% >

The years used for baseline and growth for a school depend upon when it was opened as the tables below show:

The following table shows how growth is calculated using the current formula:

Growth Calculation Current		
Year school opened	Baseline years	Growth years
2000 or before	Average of 2000 and 2001	Average of 2002, 2003, and 2004
2001	Average of 2001 and 2002	Average of 2002, 2003, and 2004
2002	2002	Average of 2003 and 2004
2003	New school not evaluated	New school not evaluated
2004	New school not evaluated	New school not evaluated

How we propose to do it.

We propose to allocate growth points using the same baseline years and growth years for all schools, as shown in the table below:

Growth Calculation Proposed		
Year school opened	Baseline year	Growth years
2000 or before	2003	Average of 2004 and 2005
2001	2003	Average of 2004 and 2005
2002	2003	Average of 2004 and 2005
2003	2003	Average of 2004 and 2005
2004	School evaluated, AIMS points solely from status	School evaluated, AIMS points solely from status

2005	School evaluated, AIMS points solely from status	School evaluated, AIMS points solely from status

Why we are changing it.

The groupings for growth points have been set base on historic performance. The current groupings were set using an average of 2000-2001 for the baseline and an average of 2001-2003 for the growth years. This one scale was used for all schools regardless of their baseline or growth years. To simplify and increase the validity of the formula, growth points for all schools should be calculated using the same scale and the same years. Choosing the baseline year of 2003 is a compromise. An earlier baseline year would preclude more schools from earning growth points.

New growth groups are required due to a new baseline and new standards for AIMS. The proposed growth groups are given in the table below.

Grade	Subject	Growth Group 1	Growth Group 2	Growth Group 3	Growth Group 4	Growth Group 5	Growth Group 6
3	Math	<-15%	-15 - -5	-6 - 1%	2 - 9%	10 - 17%	>18%
3	Read	<-20	-20 - -12	-13 - -5	-6 – 0	1 – 8	>9
3	Writ	<-13	-13 - -3	-4 – 3	4 -12	13 – 21	>22
5	Math	<-08	-8 – 0	1 – 8	9 -18	18 – 25	>26
5	Read	<-10	-10 - -1	-2 – 5	6 – 13	14 – 22	>23
5	Writ	<00	0 – 9	10 – 20	21 – 31	32 – 41	>42
8	Math	<18	18 – 26	27 – 35	36 – 44	45 – 53	>54
8	Read	<-11	-11 - -1	-2 – 7	8 – 16	17 – 25	>26
8	Writ	<17	17 - -27	28 – 38	39 – 49	50 – 60	>61
HS	Math	<06	6 – 13	14 – 21	22 – 29	30 – 37	>38
HS	Read	<-16	-16 - -5	-6 – 3	4 – 12	13 – 22	>23
HS	Writ	<-24	-24 - -12	-13 - -2	-3 - 7	8 - 18	>19

MEASURE OF ACADEMIC PROGRESS

How we propose to do it.

Both our state and national advisory committees recommend that the MAP for this year be calculated by comparing student performance on the 2004 Stanford 9 (SAT 9) to the 2005 AIMS. Individual student scores will be adjusted against the state norms for the 2004 SAT 9 and the 2005 AIMS. This will rank every student's score against the state average. We will then take the difference in individual student rankings. Students whose rankings remain the same or increase will be determined to make one year's growth. As with the current MAP calculation, the percent of students making one year's growth will be determined for each school. Schools will then be awarded points based on the scale below.

Number of MAP Points Earned

% Making One-Year's Growth	Points earned
75-100	8
50-74	6
25-49	4
0-24	2

To ease the transition to a new MAP calculation, schools will receive the best of either the MAP points earned for the 2004 profile or the points earned using the above method.

DETERMINATION OF THE SCHOOL PROFILE

How it is done now.

To earn a highly performing or excelling profile, a school must meet the goals for percent of students exceeding the standard. This is calculated as a three-year average across all grades and subjects.

Example. The following table shows distribution of AIMS scores for Gila Monster Elementary. The numbers are for all grades in Gila Monster Elementary for which the AIMS is administered.

Number of Students Exceeding the Standard—All Grades

Subject	Reading		Mathematics		Writing	
Year	# Exceeding	#Tested	# Exceeding	#Tested	# Exceeding	#Tested
2002	25	100	24	100	23	100
2003	24	105	23	105	22	105
2004	26	99	25	99	24	99
Total	75	304	72	304	69	304

The percent of students exceeding the standard is then:

$$\text{Percent Exceeding} = \frac{75 + 72 + 69}{304 + 304 + 304} = 23.6\%.$$

Since Gila Monster serves both grades 3 and 5, it must meet thresholds of 39 percent of students exceeding the standard to be classified as highly performing, and 38.8 percent to be classified as excelling. Gila Monster Elementary meets neither threshold.

How we propose to do it.

The percentage of students exceeding the standard declines in higher grades. For example, the percentage of students exceeding in third grade is 16 percent while the percentage of students exceeding in eighth grade is 6 percent. The current formula imperfectly corrects for this by having differing thresholds for schools depending on grades served. With the addition of additional grades, this method is impractical.

We propose to use the following method to determine if a school is highly-performing or excelling.

1. For each school, we will calculate the percent exceeding by grade across all three subjects for both 2003-05 and 2005.

2. To control for differences in percent exceeding by grade, we will adjust the percent-exceeding number into a z-score by subtracting the statewide average for that grade for percent exceeding and dividing by the statewide standard deviation.

3. We will then average the one- and three-year z-scores across all grades for a school. Each school will have two z-scores: one based on its three-year average for percent exceeding, another based on the percent exceeding for the current year.

4. Compare the higher of a school's one- and three-year z-scores to a table (yet to be determined) to find a school's final profile.

For schools that have earned enough points via AIMS, MAP, etc. to be highly performing or excelling, but do not meet the goals for percent students exceeding, ADE proposes to designate these schools as performing-plus.

Why we are doing it.

The transition to the new norm-referenced test makes comparisons between years problematic. Our advisory groups were unanimous that this is the best transition method.

Taking the best of either the current year or the three-year average recognizes schools showing improvement in percent exceeding sooner than if current performance is submerged in an average. The performing plus designation distinguishes schools with otherwise above average performance that do not meet the percent-exceeding target.